DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN FILE REPORT
79 - 1224

Base from U.S. Geological Survey, 1:250 000 Chandler Lake, Killik River, 1956

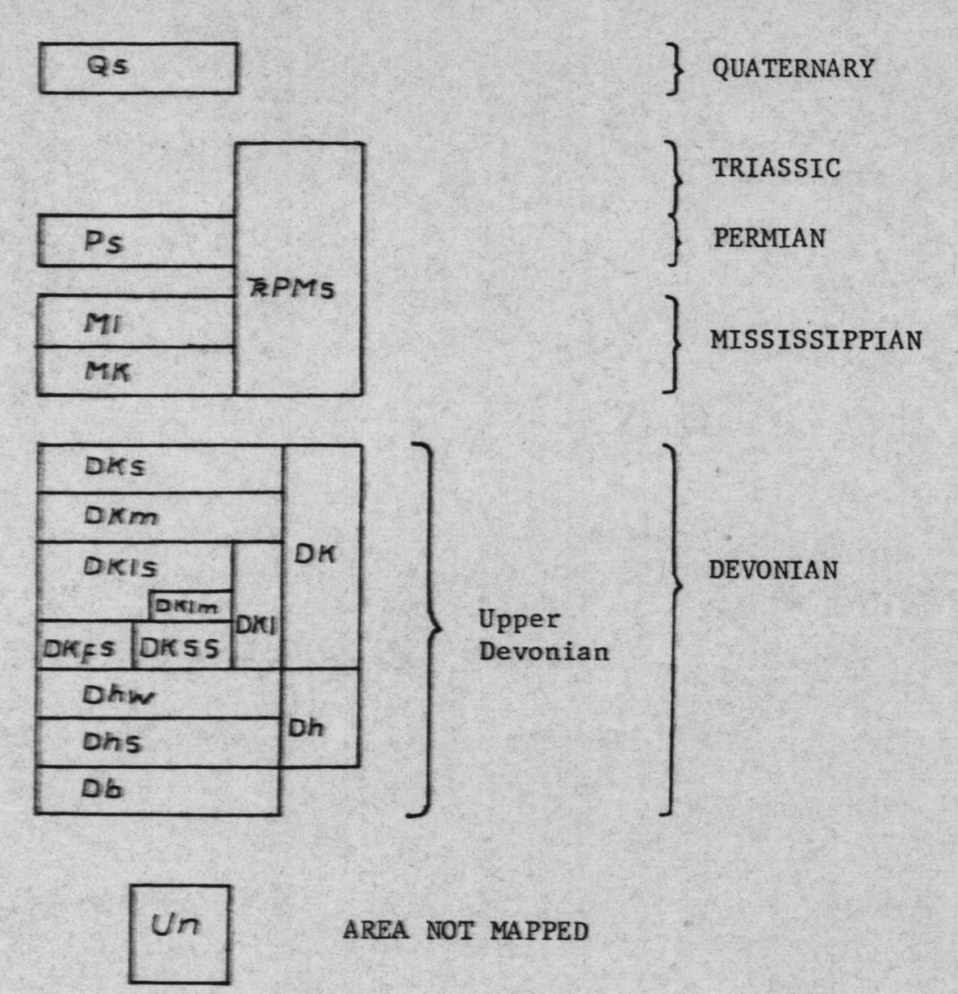
SCALE 1:200 000

5 0 5 10 15 20 Statute Miles

5 0 5 10 15 20 25 30 Kilometers

Geology by: A. L. Bowsher, and J. T. Dutro Jr., 1949; M. D. Mangus, and R. L. Detterman, 1949; W. W. Patton Jr., and I. L. Tailleur, 1949, 1950; W. W. Patton Jr., M. D. Mangus and W. P. Brosgé, 1951; S. C. Porter, 1959, 1960; W. P. Brosgé, H. N. Reiser, J. T. Dutro Jr., and T. H. Nilsen, 1977, 1978.

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qs — SURFICIAL DEPOSITS, UNDIVIDED (Quaternary) -- Mostly glacial, alluvial and lacustrine deposits. Shown only in the larger valleys. Deposits in the Chandler Lake quadrangle are mapped in detail by Hamilton (1979).

TRPMs — SHUBLIK FORMATION (Triassic), SIKSIKPUK FORMATION (Permian), LISBURNE GROUP (Mississippian) AND KAYAK SHALE (Mississippian) UNDIVIDED -- In the larger areas consists mostly of 700 to 1,000 m of limestone and dolomite of the Lisburne Group, with minor amounts of shale and siltstone of the other formations. In the small areas shown on Ekokpuk Creek consists of: black shale and minor limestone of the Kayak Shale; 15 to 70 m of black chert and phosphatic limestone tentatively assigned to the Lisburne Group; 15 to 40 m of orange-weathering siliceous shale and siltstone of the Siksikpuk Formation; about 30 m of fossiliferous shale, chert, and limestone of the Shublik Formation.

Ps — SIKSIKPUK FORMATION (Lower Permian) -- Gray, green and red argillite and siltstone, siliceous shale and siltstone, and brown-weathering calcareous siltstone. Shown separately only in one small area northeast of the Anaktuvuk River. Marine. Thickness generally less than 100 m (see Patton and Tailleur, 1964).

Ml — LISBURNE GROUP (Mississippian. Top beds are Pennsylvanian about 30 km east of the map area, but Pennsylvanian beds are not known in the map area.) -- Mostly gray limestone and dolomite with nodular chert; a zone of dark gray phosphatic limestone, shaly limestone and shale occurs in upper part. Marine. Generally about 700 to 1,000 m thick; thickness less than 300 m where mapped separately on Ekokpuk Creek.

Mk — KAYAK SHALE (Mississippian) -- Mostly dark gray shale. Upper part also includes interbedded argillaceous and ferruginous limestone; lower part includes interbedded brown-weathering shale, siltstone and shaly sandstone, ironstone nodules and a few phosphatic nodules; lowest beds are bioturbated sandstone. On upper Kollutuk and Inukpasugruk Creeks south of Anaktuvuk Pass the shale also contains beds 10 to 30 m thick of green andesitic tuff and volcanic pebble-to-boulder conglomerate (see Reiser, Brosgé, Dutro, and Detterman, 1979). Marine. Total thickness about 300 m.

Dk — KANAYUT CONGLOMERATE (Upper Devonian) -- Divided into:

Dks — Stuver Member -- [Same as Stuver Member of Bowsher and Dutro (1957), Porter (1966), and Brosgé, Reiser, Dutro and Detterman (1979).] Mostly shale, shaley siltstone and thin-bedded sandstone and quartzite with minor thick beds of quartz- and chert-pebble conglomerate. Deposited in fining- and thinning-upward cycles. Shale micaceous, dark gray, greenish gray, reddish gray and brown. Sandstone commonly weathers yellow and brown; silica-cemented quartzite and conglomerate commonly weathers white. Plant fragments abundant, especially in upper part. Nonmarine. Contains plant fossils of Late Devonian age near Shainin Lake (Bowsher and Dutro, 1957) and Anaktuvuk Pass (Porter, 1966). About 250 to 300 m thick in most of the area north of the Toyuk thrust and east of the Okokmilaga River. However, near the heads of Alapah Creek and the Nanushuk River the member, as mapped, also includes an additional upper unit of undetermined age, about 300 m thick, of dark gray shale, thin to thick beds of quartz arenite sandstone and some coal. Member not recognized in most of the area south of the Toyuk thrust.

Dkm — Middle conglomerate member -- [Same as the middle conglomerate member of Bowsher and Dutro (1957) and Brosgé, Reiser, Dutro and Detterman (1979); equivalent to the upper part of the conglomerate member of Porter (1966). As mapped, may include some unidentified Stuver Member.] Conglomerate, quartzite, sandstone and minor amounts of siltstone and shale in fining- and thinning-upward cycles 2 to 15 m thick. Conglomerate, in beds 1 to 7 m thick, generally forms 30 percent to 60 percent of the member; near Shainin Lake in the NE part of the area it forms virtually all of the member; in the extreme SW part of the area it is absent. Conglomerate composed of pebbles and cobbles of chert, quartz and minor amounts of quartzite in matrix of same composition, mostly firmly cemented by silica, but locally calcareous or limonitic. Maximum size of clasts ranges from 10 to 18 cm in the NE part of area to about 3 cm in NW. Hard, silica-cemented quartzite and limonitic, hematitic or calcareous sandstone are of same composition as the conglomerate, but are commonly thinner bedded and cross-bedded, except in cycles where conglomerate is missing and massive quartzite forms the base of a cycle. Shale and siltstone are mostly red and green with minor amounts of black, pyritic shale. In SW corner of map area only black shale is present. The shale and siltstone are absent from many of the cycles, and, in the NE, are absent from most of the cycles. Nonmarine. Rare coaly plant fragments. Thickness about 300 to 500 m.

Dkls — Lower shale member -- [Same as lower member of Bowsher and Dutro (1957) and lower shale member of Brosgé, Reiser, Dutro and Detterman (1979); equivalent to lower part of conglomerate member of Porter (1966).] Shale, siltstone, sandstone, quartzite and conglomerate in fining- and thinning-upward cycles generally 2 to 10 m thick, but locally as much as 40 m thick. Micaceous shale and siltstone with thin interbeds of sandstone form about 50 percent of member and are most prominent in the area north of the Toyuk thrust, where the porportion of shale increases downward in the member, and shaly intervals as much as 30 m thick account for the great thickness of some cycles. Shale and siltstone are mostly red, gray-green and brown, but along south edge of map area the shale is mostly black. Conglomerate and conglomeratic sandstone and quartzite in beds generally 1 to 3 m thick, but as much as 10 meters thick, form 10 percent to 20 percent of member in most of area, but are scarce or absent along south edge of area. Conglomerate is composed of pebbles of chert and quartz in matrix of same composition; it commonly is limonitic, in part firmly cemented by silica, locally calcareous. Maximum clast size seen is 6 to 8 cm in eastern part of area, 3 to 4 cm in western part. Silica-cemented quartzite, limonitic or calcareous sandstone and limonitic quartz-chert wacke are thin- to medium-bedded and commonly cross-bedded where they form the middle of a cycle, are thick-bedded where conglomerate is missing and they also form the base of a cycle. Silica-cemented quartzite scarce along south edge of area east of John River. Nonmarine. Contains a few unidentified plant fossils. Thickness generally about 300 to 500 m, but only about 150 meters on upper Itkillik River, where member pinches out to south and east. Lower contact gradational except in NW part of area where massive marker bed (Dklm) is present at base. Includes:

Dklm — Massive marker bed -- Massive brown, partly quartzitic conglomerate with clasts as large as 10 cm; interbeds of thin bedded wacke and red shale. About 30 m thick.

Dkss — Sandstone member -- [Same as lower member of Porter (1966) and sandstone member of Brosgé, Reiser, Dutro and Detterman (1979).] Sandstone, shale, quartzite, and conglomerate, generally in fining- and thinning-upward cycles 2 to 15 m thick; locally in cycles that coarsen and thicken upward. Sandstone forms 30 percent to 60 percent of member and typically is either light brown, fine grained, thin bedded, partly calcareous, with many load casts, or light gray, fine to coarse grained, thick bedded, and partly calcareous, with some scattered granules or small pebbles of quartz and chert. Minor amounts of orange-weathering quartz-chert wacke in NE part of area. Silica-cemented quartzite less common than in other members, but measured porosity of sandstone is only 1.3 percent to 6.5 percent; permeability 2 to 17 millidarcies. Shale forms about 30 percent to 70 percent of member; it is dark gray and brown, and commonly contains small ironstone nodules; some red shale in NE part of area. Conglomerate, generally present at base of cycles in northern part of area, and most abundant in NE part, is composed of granules and small pebbles of chert and quartz in quartzitic to slightly hematitic or calcareous sandstone matrix. Largest clast seen is 6 cm. Composition of member variable; sand/shale ratio decreases southward and westward. In the NE a complete cycle is about 60 percent massive quartzite or thick-bedded conglomeratic sandstone, and thin-bedded brown sandstone and wacke; about 40 percent dark gray and red shale that locally contains lenses of fossiliferous calcareous sandstone or hematitic brachiopod coquina. In the most shaly sections to the south and west the cycle is: about 30 percent thick-bedded quartzite and thin-bedded sandstone; about 70 percent interbedded shale and very thin-bedded to shaly calcareous sandstone that locally contains brachiopods. Partly marine and partly nonmarine. Contains brachiopods, clams and, at one locality, tentaculitids. Plant fragments common. Thickness generally ranges from about 100 to 550 m; unit locally absent because of facies change. In some places included in the undivided lower part of the Kanayut Conglomerate (Dkl).

Dkfs — Ferruginous sandstone member -- [Lateral equivalent of the sandstone member.] Hematitic and limonitic thin-bedded cross-bedded sandstone; dark gray shale and phyllite with ironstone nodules; gray and pink limonitic thick-bedded sandstone with a few hematitic pebbles. No chert-pebble conglomerate seen. Silica-cemented quartzite rare; sandstone locally schistose. Marine and probably in part nonmarine. Brachiopods in dark red sandstone and in coquina lenses in shale in and just south of map area. Few plant fragments. Estimated thickness between 300 to 500 m.

Dkl — Lower shale member, sandstone member and ferruginous sandstone member, undivided.

Dh — HUNT FORK SHALE (Upper Devonian) -- Divided into:

Dhw — Wacke member -- [Same as the unnamed Devonian shale and sandstone of Bowsher and Dutro (1957) and the wacke member of Brosgé, Reiser, Dutro and Detterman (1979).] Shale and shaly siltstone, quartz-chert wacke, quartzite and sandstone; in cycles generally 2 to 15 m thick. Both coarsening-upward and fining-upward cycles. Shale and siltstone form about half of member, are gray-green and black, manganiferous; contain thin beds of wacke and calcareous sandstone, nodules of ironstone and small lenses of ferruginous conglomerate composed of clam, snail and brachiopod fragments, shale chips and black chert and ironstone pebbles. Wacke is gray-green, limonitic, generally fine to medium grained, micaceous, thin bedded, in part firmly cemented by silica. Ripple markings, cross-strata, planar strata, load casts and shale chips common; some graded beds. Interbedded with minor amounts of quartzite and calcareous sandstone. In NE part of area a few beds of quartzitic granule or small-pebble conglomerate or of wacke with stringers of black chert pebbles occur at most localities. Marine. Brachiopods common in coquinoid conglomerate lenses, fine-grained sandstone and siltstone. Tentaculitids at one locality. Plant fragments common. Estimated thickness about 300 to 500 m. Absent in extreme SE part of area, and less than 100 m thick in a part of the SE area where it is included in the undivided Hunt Fork Shale (Dh). Also absent near the Okokmilaga River in the western part of the area.

Dhs — Shale member -- [The type section of the Hunt Fork Shale on Inyugakuligit Creek (Chapman, Detterman and Mangus, 1964) is entirely in this member.] About 90 percent dark gray and olive shale. Zones of interbedded light brown-weathering very thin bedded, partly calcareous siltstone and fine-grained sandstone make conspicuous pink bands across the outcrop. Minor gray and brown fine- to very fine-grained quartzite and limonitic wacke. Rare fossiliferous argillaceous limestone and fossiliferous lenses of calcareous ferruginous conglomerate composed of black chert and ironstone pebbles. Marine. Brachiopods and corals scarce. Thickness more than 800 m in eastern part of area (Porter, 1966); more than 1,000 m in type section in western part (Chapman, Detterman, and Mangus, 1964).

Db — BEAUCOUP FORMATION (Upper Devonian) ---[Newly named formation described in Dutro, Brosgé, Reiser and Detterman (1979). Same as the unnamed Upper Devonian brown calcareous clastic rocks of Brosgé, Reiser, Dut ro and Detterman (1979).] Gray shale that weathers light brown, orange and gray. Interbedded fossiliferous dark gray limestone about 10 m thick in SW part of area. Marine. Brachiopods and corals. Thickness in map area not known; 300 to 650 m thick east of area.

References

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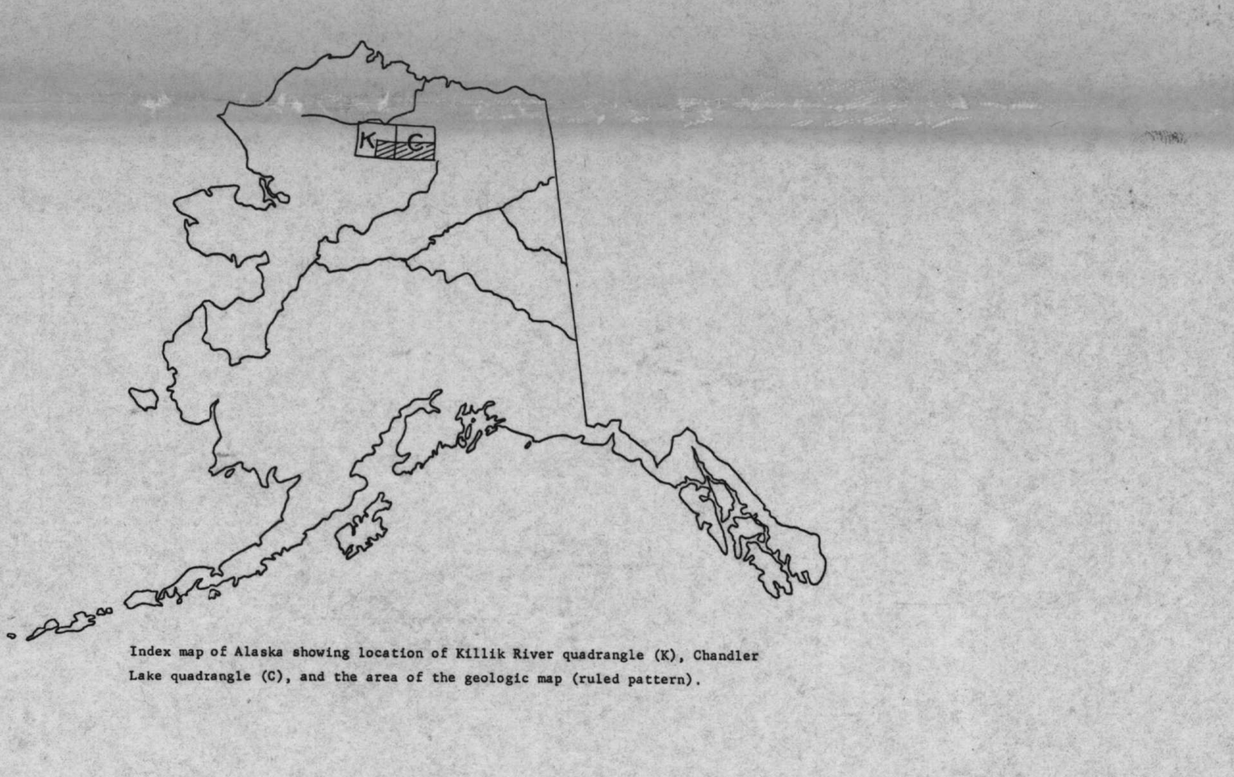

Index map of Alaska showing location of Killik River quadrangle (K), Chandler Lake quadrangle (C), and the area of the geologic map (ruled pattern).

GEOLOGIC SYMBOLS

Contact - Dashed where approximately located; dotted where inferred.

Fault - U, upthrown side; D, downthrown side. Dashed where approximately located; dotted where inferred.

Thrust fault - Sawteeth on upper plate. Dashed where approximately located; dotted where inferred.

Anticline - Approximately located. Showing crestline.

Overturned anticline - Approximately located. Showing direction of dip of limbs.

Syncline - Approximately located. Showing troughline.

• B Locality where brachiopods found in the lower part of the Kanayut Conglomerate.

This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.

GEOLOGIC MAP OF DEVONIAN ROCKS IN PARTS OF THE CHANDLER LAKE AND KILLIK RIVER QUADRANGLES, ALASKA

By

W.P. Brosge', H.N. Reiser, J.T. Dutro Jr., and T.H. Nilsen

1979